Space Weather Forecast

Issued on Wednesday, 23 November 2022 at 13:19 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight Chance of R1/R2 radio blackouts throughout. Slight chance of Minor Geomagnetic Storm (G1) intervals by the end of the period.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low with a number of common class flares occurring, the strongest of which are from a recently developed sunspot region in the southern centre disc. This appears to have now matured, with a number of small spots fading. The other two sunspots persist as mature features but with no notable development ongoing. Weak CMEs (coronal mass ejections) were observed including one from the flaring of the newer sunspot, with the potential for an Earth-directed component. However this has yet to be fully assessed.

Solar Wind / Geomagnetic Activity: The solar wind persisted at background levels throughout. The total magnetic field strength remained weak with north-south component also only varying weakly. Geomagnetic activity remained Quiet (Kp 0-1).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain low, with a slight chance of isolated moderate-class X-ray flares.

Solar Wind / Geomagnetic Activity: There are two CMEs on or close to the Earth-Sun line, however these area low confidence for any arrival. The first, from a common-class flare on the 22nd, is likely to pass south of Earth, underneath its orbit but may give a glancing impact. The CME from the 23rd has yet to be fully analysed. Otherwise current background solar winds have the potential to become enhanced day 1 (23rd) into day 2 (24th) due to the arrival of the fast winds from a small coronal hole. This is low confidence, however further enhancements are possible through the period, from either the weak passing CMEs or from the arrival of further fast winds towards the end of the period. Mainly Quiet geomagnetic activity is likely to increase to Unsettled with a chance of Active intervals and a slight chance of G1/Minor Storms day 1 and day 2 (23rd and 24th). Activity easing to mainly Quiet with isolated Unsettled spells, but still a chance of Active with a slight chance of G1/Minor storm intervals.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to persist at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	30	10	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	15	15	15	15
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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